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### John Erskine, Earl of Mar: Architecture, Landscape & Industry

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## John Erskine, 6<sup>th</sup> and 11<sup>th</sup> Earl of Mar (1675–1732): Architecture, Landscape and Industry

This paper briefly introduces the political background to Lord Mar's belief that economic and industrial developments were the preconditions for the restoration of Scotland's political autonomy following the Act of Union of 1707. It defines the term Scottish Historical Landscape, and describes and places Mar's design for his estate at Alloa in Clackmannanshire in the stylistic context of formal landscaping c.1700. There is a description of the Gartmorn System, a hydraulic engineering scheme devised for Mar by George Sorocold, the technology it used and its impact on industrial development in Clackmannanshire. Another scheme for supplying water to Alloa was designed by a French engineer and this is also described. The Alloa plan included forestry plantations, a new road network for the movement of coal to the harbour and harbour improvements. Mar was also aware of the need to house the population and to develop different areas for dwelling and industry. The ideas behind this complex scheme can be explained by an awareness of infrastructure planning in France and linked to Edward's tour in 1700 and to other activities of the Scottish Parliament before the union of 1707.

### INTRODUCTION

The diversity and breadth of Lord Mar's thinking involved him in designing buildings, managing forestry, industrial developments, coal mining, the aesthetics and execution of landscape design, and urban and constitutional planning. A prime motive at the outset of his life was industry – he had inherited an ancient, distinguished but impoverished estate while still a boy; family pride, his own questing intelligence and his compassionate concern for Scotland's well-being were the primary driving forces behind all his innovations. Believing only a political solution could deliver improvement on the scale he envisaged, Mar became a forceful leader in the negotiations for the union of the Scottish and English parliaments.

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Scotland, he wrote, was in a 'low & declining condition . . . I then conceived [the Union to be] the only practicable way, as things stood, for the relife of our Country.'<sup>1</sup>

Christopher Whatley has noted that 'Scotland's material condition mattered profoundly' to the nation's leaders at the time and that poverty was a primary motivation for union.<sup>2</sup> On the eve of the Union, Mar became 'in effect leader of the Scottish parliament',<sup>3</sup> and 'but for Mar's talent as a manager, the way to union might have proved not just hard but impossible.'<sup>4</sup> But it was the potential for economic investment that most interested Mar – winning concessions for Scotland had been a deeply personal issue because, in order to persuade the anti-Unionists in the Parliament of the benefits of voting for the Union, he had staked his honour and his reputation on obtaining financial concessions. Article 15 of the Treaty of Union awarded Scotland a lump sum to equalise the discrepancies between the two currencies. These funds were to be paid annually and put towards the development of industry in Scotland.

This was enacted in 1727 with the founding of the Board of Manufactures and Fisheries in Scotland – an enormously successful body that led industrial improvement until its dissolution in 1906. Articles 13 and 14 of the Union which guaranteed important concessions on the taxation of malt and salt fared less well – the tax concessions, to Mar's outrage, were ignored.<sup>5</sup> He began negotiations with the exiled *de jure* King James VIII based on the proposition that if the king was restored to his throne he would dissolve the incorporating Union and replace it with a federal constitution devised by Mar. Mar was prepared to support any government that would deliver economic and industrial benefits to Scotland.

#### ALLOA AND THE SCOTTISH HISTORICAL LANDSCAPE

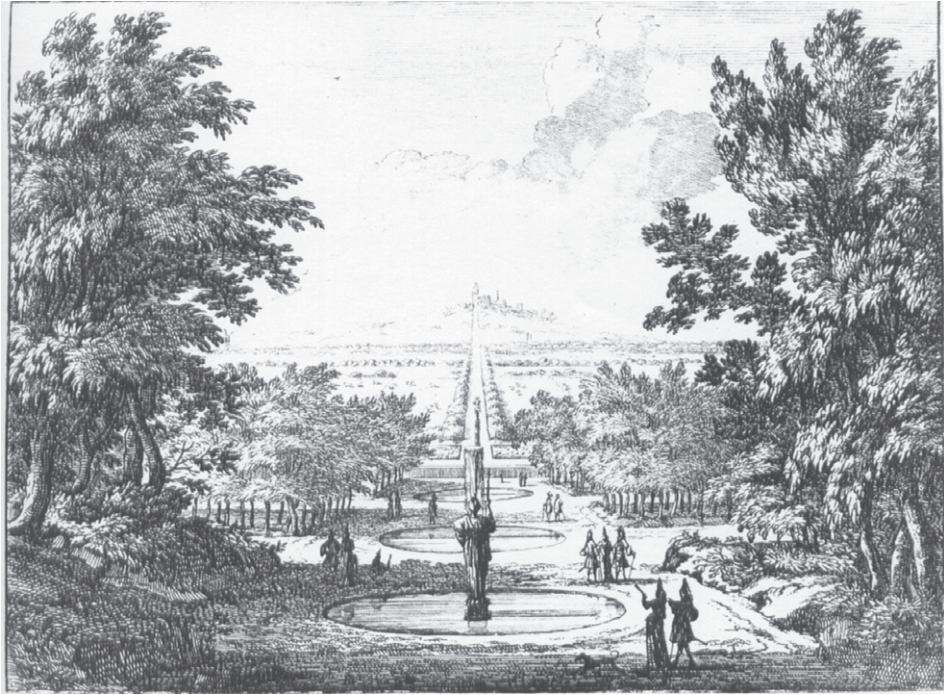
John Lowrey has explained the origins of the Scottish Historical Landscape in his pioneering study of the landscapist Alexander Edward. Edward worked for Bruce at Kinross and for Mar at Alloa (Figure 1). The style of landscaping described at Kinross, where the controlling central axis is focused on the historical monument of Loch Leven Castle, set in train a series of gardens of this type in Scotland. The style reached its zenith at Alloa (begun in 1702) where, in addition to focusing avenues on historical monuments Mar also directed his avenues on industrial developments and natural features. The characteristics of the Scottish Historical Landscape are: a design is imposed on a site either by straight, axial avenues and sometimes also with panorama terraces; the avenues or views terminate on, or are directed towards, pre-existing natural or historic features such as battle sites, monuments or industrial developments; the imposed design induces the contemplation of the landscape, its past and future and its impact on the locality. This enhances the landscape's existing local, national or dynastic identity while the site and the features within it continue to function as part of an everyday working landscape. Focusing avenues in this way was done in old hunting parks where the avenues were aligned on distant features to help orientate the riders. For



1. Alloa, Mar's plan, 1702 with additions up to his death in 1732. (NAS RHP 13258.1)

instance, at Versailles, before it was enlarged by Louis XIV, one avenue was directed on a church steeple and another on a village. However, in the Scottish Historical Landscape these focal points recall historical associations. As yet we have no evidence of how many Scottish





2. Cleves: the formal landscape at Cleves had directional avenues focused on churches in the locality.

Historical Landscapes existed in Scotland but in 1707 Lord Archibald Hamilton commented that Scotland's gardens were 'finer than anybody will believe who have not seen them', and that there were many more projects underway at that time.<sup>6</sup> General Roy's maps suggest this was indeed the case as they record many other formal landscapes that appear to have reached maturity by the 1750s.

What we do not yet know is how unique it was in Europe in this period to devise landscapes around the idea of vistas directed on historic or natural features. Extensive searches have produced only one other comparable scheme – the mid-seventeenth-century gardens of Prince Johan Maurits von Nassau-Siegen at Cleves (Figure 2). The earliest extant record of a Scot visiting Cleves is the visit made by Lord John Hope in 1724 on the recommendation of his uncle the Marquess of Annandale.<sup>7</sup> From the hilltop, called the Starmount, walks pointed on the towns of Arnhem, Nijmegen and the amphitheatre designed by Van Campen (Van Campen also designed the Mauritshaus for Prince Johan).<sup>8</sup> One engraving shows what appears to have been a large revolving lens mounted on a stand for the use of visitors to the park. Cleves was a renowned European court: Nicholas Mercator, the geographer, worked here as a mathematician – later in the 1680s he designed the fountains at Versailles; his contemporary, the philosopher René, evolved his theory

of mathematical coordinates at Cleves. Cleves was a centre for mathematics, cartography, surveying, optics and new telescopes – all skills essential to landscape designing.

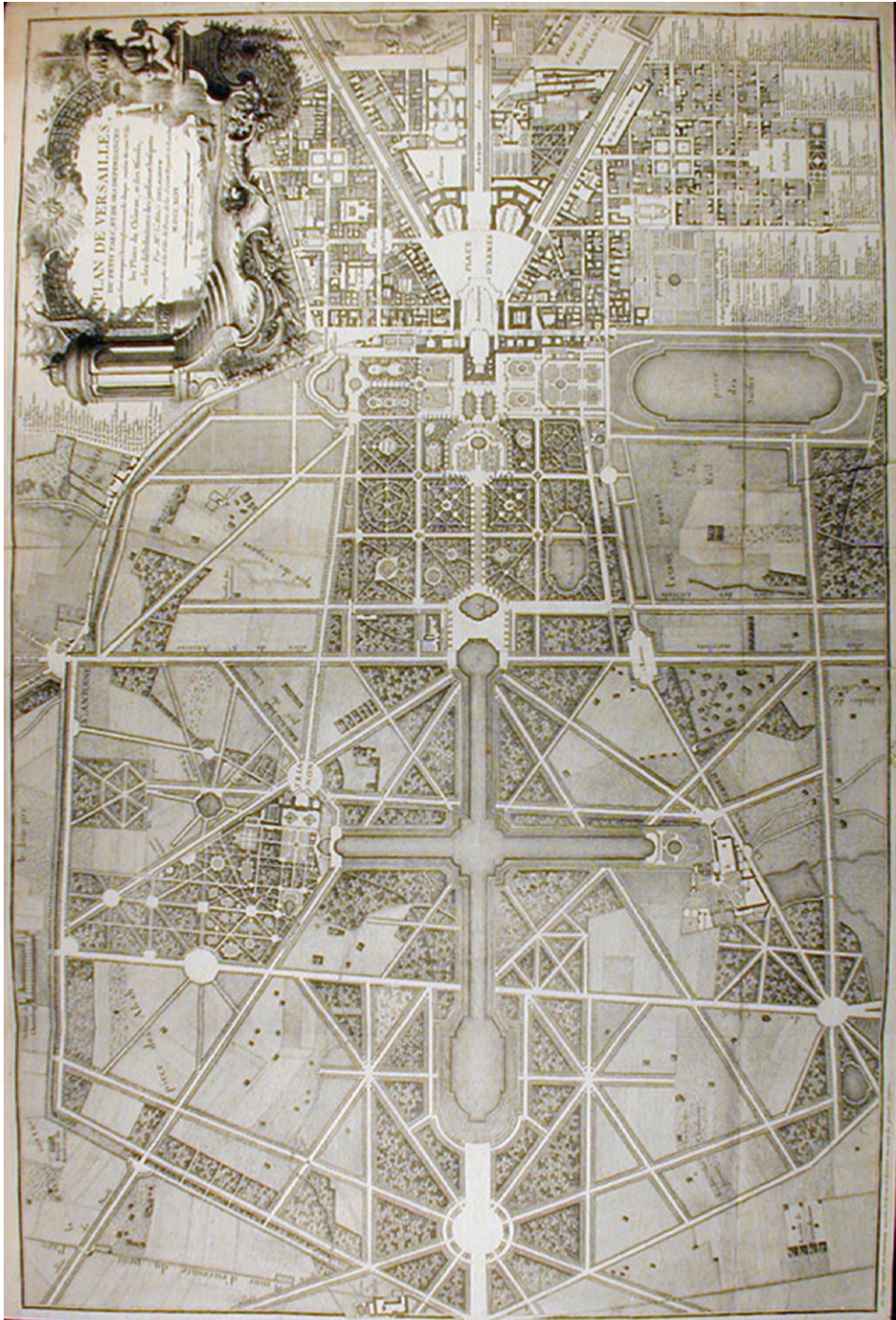
#### DESCRIPTION OF THE ALLOA PLAN

Louis XIV's Versailles undoubtedly inspired portions of the plan at Alloa: these included the kite-shaped gardens at the centre (Figures 1 and 3), the three great avenues through the parks on the west side of the gardens, and the 'New Town of Alloa' (modelled on the French government's bureaucratic district). Within this geometry are different 'zones' of activity – agriculture, forestry, coal mining, industrial production and dwelling. The House of Alloa stands at the centre surrounded by the flood plain of the Firth of Forth. Nearly all the avenues outwith the private gardens were used as roads for transporting coal, timber and livestock to the harbour for export. To the north of Alloa, at the top of the plan, are the central uplands of Clackmannanshire with two circular forestry plantations that are nowadays called Mount William Wood and Octagon Wood (Figure 1, top). Farther north still, and beyond the edges of the plan, lies the Gartmorn Dam that Mar constructed in 1711–12 (Figure 4), and beyond that at the northern boundary of the county of Clackmannanshire are the Ochil Hills. Thirty-two avenues radiate from the House of Alloa and terminate on historic and natural features in the landscape including Stirling Castle, Carnock, Clackmannan Tower, Mar's water engine at Parkmill, Kennet House, Alloa Ferry, Tulliallan House and the Lime Tree Walk that points to the harbour and Elphinstone Tower (later Dunmore) on the southern bank of the Firth of Forth. The gardens at Alloa were magnificent and furnished with all the latest waterworks, statues and topiary expected at that date. The whole scheme is bisected by the 'Grand Allée', the southern end of which terminates at the harbour on a pair of obelisk gate piers (Figure 5).<sup>9</sup>

#### GARTMORN SYSTEM

Alloa was a small estate and its most lucrative product was coal, but the over-abundance of water was difficult to manage and the coal pits beneath the flood plain, and the day level pits further north in the county, were frequently flooded. Mar's efforts c.1700 to drain the pits had failed due a lack of adequate powered drainage and the coal trade at Alloa was virtually stagnant.<sup>10</sup> The distinguished hydraulic engineer George Sorocold (1684–1718) had successfully constructed waterworks for Derby (1692), Leeds (1694), Norwich (1698) and Nottingham (1700). In 1700 he went to London where he created the London Bridge Works (Figure 6). It may have been there that Mar first became aware of Sorocold's work because he visited Alloa to advise on the drainage problem in 1709 and 1710.<sup>11</sup> Sorocold suggested the construction of the Gartmorn System in the uplands of Clackmannanshire (Figure 4). It was built between 1711 and 1712, and is a hydraulic system unparalleled in the UK in the eighteenth century, and it is one of Sorocold's greatest engineering achievements.<sup>12</sup>





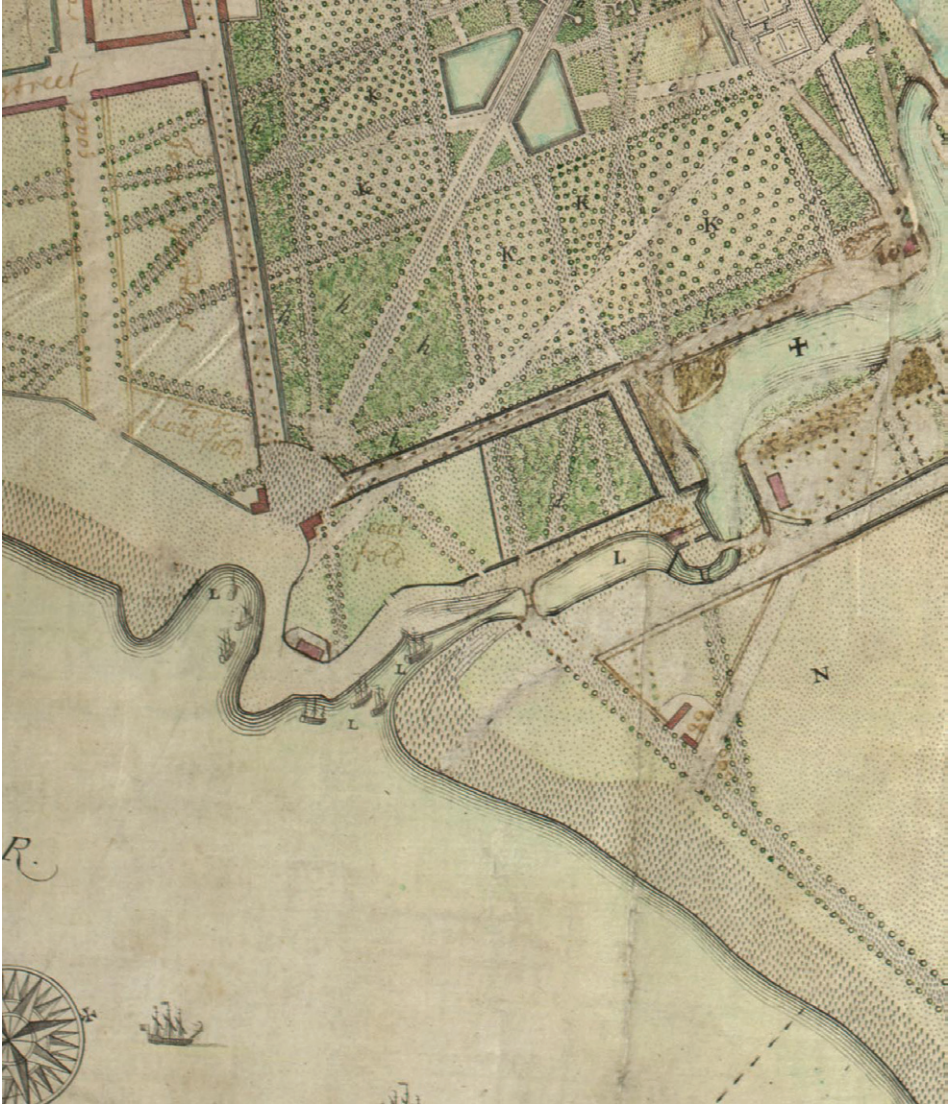
3: Delagrive, plan of Versailles in 1746. Places des Armes (right), the great gardens (left) and the bureaucratic district (lower right) were used in the design for Alloo. (Author)





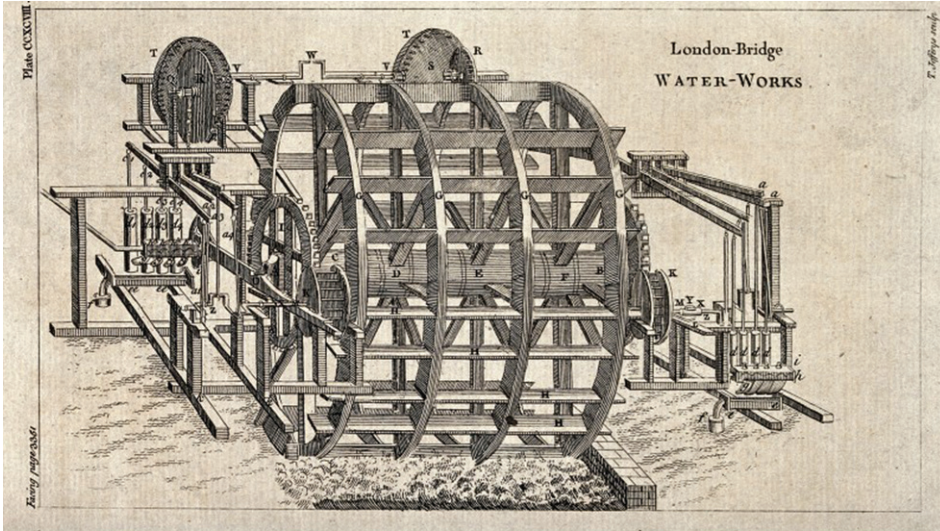
4. Ordnance Survey sheet NS/89/99 (detail): Forestrill is on the far right and between it and the Gartmorn Loch on the left runs the aqueduct that Mar completed in 1712. (Crown copyright Ordnance Survey. All rights reserved)





5. Alloa, Mar's plan, detail of Figure 1 showing the harbour. (NAS RHP 13258.1)

Sorocold surveyed the route for a fee of £50: he used a 'large wooden quadrant set upon a tripod with brass lights along the upper radius, the index being a plummet suspended by a fine thread.'<sup>13</sup> William Hutton, the mine's manager, and Mar's brother Lord Grange oversaw its construction.<sup>14</sup> It had been hoped that the dam would produce the higher level of energy needed to operate a wheel and hydraulic pumping engines, but Mar was unable to find men with the skills to build these



6. George Sorocold's waterwheel at the London Bridge Works. (Author)

pumps so a chain and bucket engine driven by a giant waterwheel was constructed instead.<sup>15</sup>

The system begins at Forestmill (far right, Figure 4) with two high weirs that feed an aqueduct about two miles long and which ends at Gartmorn Loch (far left, Figure 4). The weirs are concave and contiguous so they form a single barrier. They are about twenty feet high and each about thirty feet wide, and lie side by side across the river Black Devon just east of the main road at Forestmill.<sup>16</sup> The weirs are positioned to divert water away from where there was formerly a high waterfall on the course of the river into the artificial aqueduct. It is not clear why two weirs were built but possibly they spread the enormous weight and pressure of water from an extremely fast flowing river. If the sluice on the aqueduct is closed when the river is in spate then the water drains over the top of the weirs into the river below. There is no reservoir of water held behind the weirs and the height of the aqueduct maintains the water at the higher level. This was a wise choice because for its first mile the aqueduct passes over and under extremely uneven terrain.

The aqueduct is about five feet wide with a footpath also about five feet wide. For its first mile it runs along the side of a deep gorge above the Black Devon River. Some sections are cut through solid rock, while others run on artificially constructed terraces about thirty to forty feet above the river. At one point, about half a mile from Forestmill, the aqueduct is carried over a waterfall by a culvert (this was rebuilt in concrete in the twentieth century). After about another mile the land levels out until it reaches the loch. At the outlet there is clear evidence of the remains of other artificial structures that might have been a weir or sluices but are now mostly washed away. The footpath from Forestmill continues along

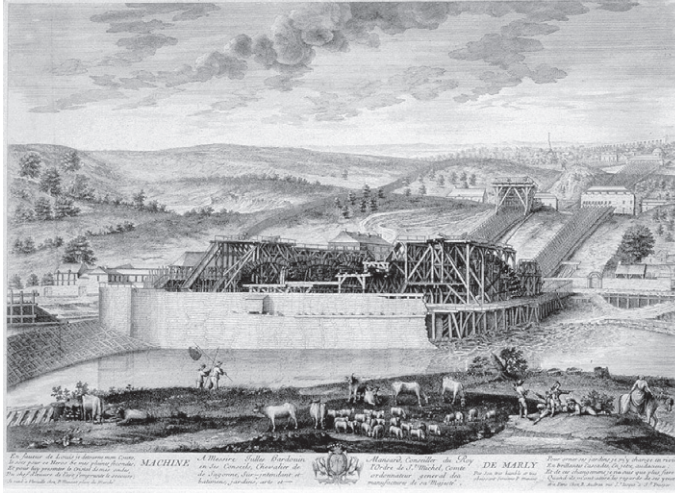


7. The Gartmorn Dam was completed in 1712: the original dam was an earthen bank while the masonry reinforcement was constructed later. (Author)

the southern and eastern sides of the Gartmorn Loch. These two sides are comprised of high artificial earthen embankments. The eastern end, known as the Gartmorn Dam, is half a mile long and sixty feet high (Figure 7). It was later reinforced with stone masonry about fifteen feet thick. The Brathie Burn which supplies Alloa town has its source at the Gartmorn Dam, and another lade that branches from it about a mile downstream, supplied energy for draining the Hilton mines.<sup>17</sup> In later years this water also powered the mills and breweries of the town.<sup>18</sup> The reservoir covers 130 to 162 acres depending on the season and would have provided sufficient power to drive Sorocold's hydraulic pumps.<sup>19</sup> Smout has described the dam as 'a remarkable engineering feat . . . for many years the largest artificial lake in Scotland'.<sup>20</sup>

Mar could not find workers to build Sorocold's hydraulic pumps so instead Sorocold built a waterwheel eighteen feet in diameter with an axle thirty-nine inches in diameter.<sup>21</sup> It was probably similar to his wheel at the London Bridge Works (Figure 6) which was twenty feet in diameter and was said to have been superior to the great works at Marly (Figure 8).<sup>22</sup> As late as 1774 the Alloa wheel was copied by an eminent Newcastle engineer who saw it while on a visit to the mines.<sup>23</sup> Another engine for lifting the coal was built at this time and





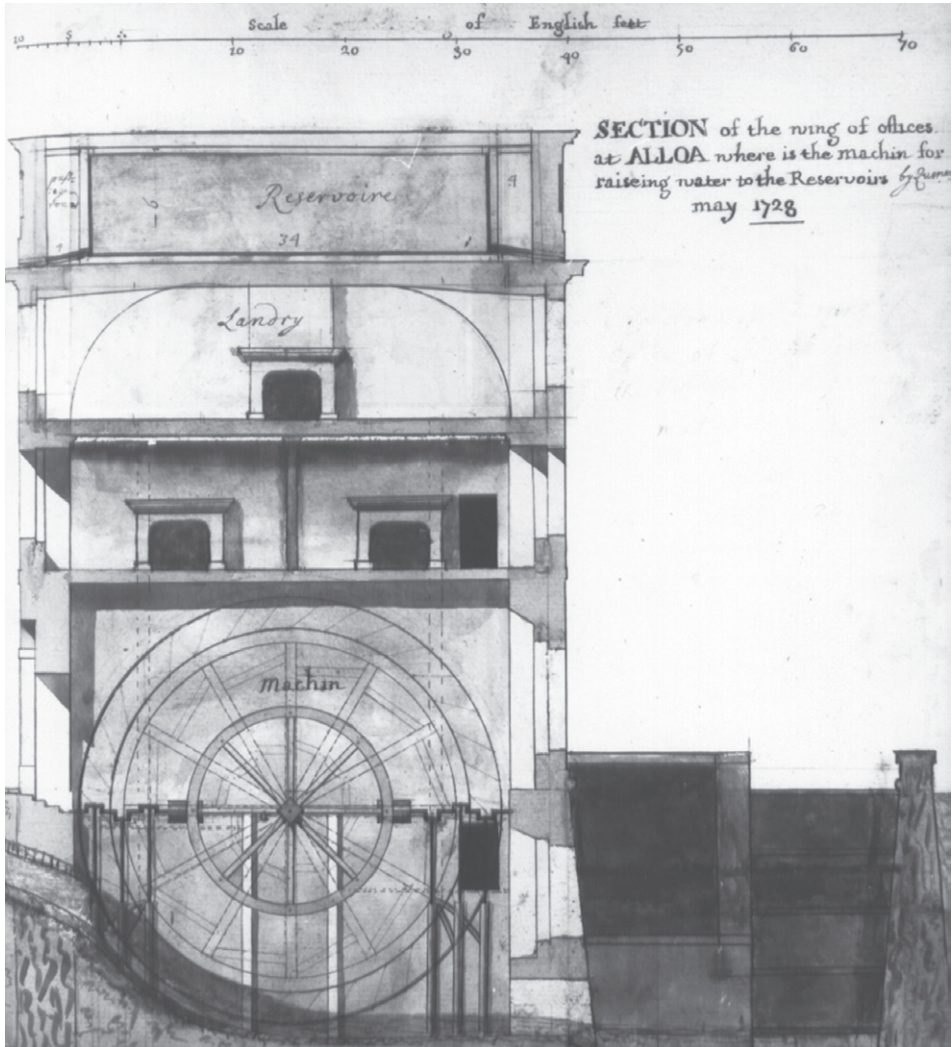
8. Pierre Le Pautre, *La machine de Marly*, 1714–24. (Author)

it may also have been designed by Sorocold as it was described in 1793 as having been in operation for seventy to eighty years.<sup>24</sup>

Mar constructed another hydraulic scheme in 1711 on the land of at the base of Clackmannan Hill. This was devised to compensate Colonel William Dalrymple for the loss of water taken out of the River Devon by the Gartmorn System. On Mar's plan there is a 'mill dam' on the river to the north of Clackmannan Hill that supplied the mill at Parkmill.<sup>25</sup> The second Statistical Account describes an aqueduct that ran on an artificial terrace round the side of Clackmannan Hill. It provided an improved flow of water to the Clackmannan wheel. The Clackmannan wheel was a focal point of one of the avenues in the policy and is marked 'T' on Mar's plan (Figure 1, lower right).

Mar also opened a new pit at Hilton less than a mile east of the 'Alloa Pitts' (*sic*).<sup>26</sup> By 1715 another lade for draining off the pit water was built; this flowed due south where it joined the Brathie Burn now sufficiently augmented to fill the very large and powerful new reservoir at Gaberstone immediately to the north-east of the town on Mar's plan. Gaberstone Dam was still in use in 1866 but is now filled in.<sup>27</sup>

In 1722 the Forfeited Estates surveyor reported that by August 1714 income from coal had reached £1,162 17s 8d Scots (£96 18s 2d sterling), but shortly before the '15 Rising the estate had made a sixfold improvement on its income to £7,520 Scots (£626 13s 4d sterling). However, the output fell off sharply in the year up to August 1716 when only £548 Scots (£45 14s 7d sterling) was obtained. The decline probably resulted from Mar's absence during the Jacobite Rising, his subsequent exile and the need for repairs to the engines.<sup>28</sup>



9. Dubuisson, engineer. The plan is signed by Mar's valet, Quin: a design for a water wheel at Alloa, 1728. (NAS RHP 13258.19)

Another hydraulic project was devised to supply the upper floors of the House of Alloa with water and for a laundry and horse pool in the stable block (Figure 9). Mar commissioned a French engineer called Dubuisson to draw up a scheme whereby a waterwheel installed in the wing of offices fed an aqueduct that filled a tank on the Comely Bank. Broken ground and fragments of masonry found on the Comely Bank in the mid-1980s were probably the remains of this scheme but a supermarket now stands over the site.

## FORESTRY

The northern section of the Alloa scheme comprises three sections of forestry: these are from north to south the two woodland plantations of Octagon Wood and Mount William Wood and the Comely Bank. The woodlands are in the wrong position on Mar's plan (Figure 1, upper centre) – they actually lie about two to three miles further north and east than he shows them (the edge of Octagon Wood is visible on the left side of Figure 4).<sup>29</sup> The distortion is deliberate so that the scheme fits the sheet and also so that the design appears more symmetrical and more in keeping with the aesthetic conventions of formal landscape drawings. Mar continued to make improvements and execute designs at Alloa during his exile, and in 1724 he described the woodlands as designed but not yet planted.<sup>30</sup> The real position of the woodlands has been established by measurements and map analysis but lack of space prevents this evidence being included in this essay.

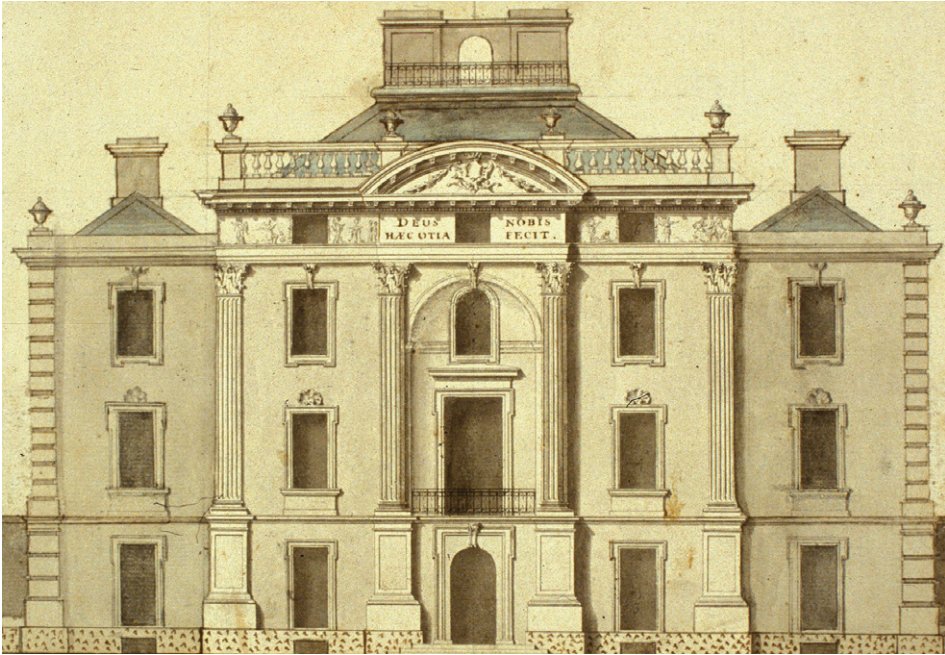
Octagon Wood takes advantage of the high hilltop and the slope downhill to the Comely Bank. The approach has to be imagined from the point of view of a rider on horseback who, on reaching the summit of Octagon Wood (295 feet), could turn his horse in several directions. The most compelling direction is the broad avenue that sweeps downhill towards the summer house on the Comely Bank: the rider travels through alternating sequences of open and closed, wide and narrow, and dark and light spaces. These create a sense of anticipation and the downward direction encourages rapid movement through clear lines of access. However, the distances would appear shorter than they were in fact because the cross avenues would have counteracted the telescopic effect of the long central avenue, particularly on approaching Mount William and the Comely Bank. Manipulating perspective in this way suggests a careful study of Le Nôtre who used these sorts of visual devices in his designs. Possibly this is a landscape designed for riding rather than hunting – Mar said that Alloa was not a good hunting estate so it may have been used for training horses to ride over different types of terrain. An important part of the estate's income was from breeding horses and cattle which were brought down from the Mar estate at Braemar and grazed at Alloa before being sent to market.<sup>31</sup>

The Comely Bank had a small summer house on it but it is not clear if this was the same design as 'Villa N' which Mar shows on his plan (Figure 10) or an earlier building.<sup>32</sup> On the plan it is situated within a circular plantation approximately 400 feet in diameter. It has a balcony with views towards the ancient forest of Clackmannan and was conveniently near to the 'goff field' (golf) on the north side of Clackmannan Hill.

## TRANSPORT AND HARBOUR

Crucial to the success of the coal industry was a more efficient road network to the harbour. Traditionally the estate's farmers were obliged to transport the coal from the pits in hand- or horse-drawn carts a distance of two miles to the harbour.<sup>33</sup> The present day B907 Alloa–Edinburgh road and its roundabout on the north-east side of the town were designed





10. Mar's design, called 'Villa N'. (NAS RHP13257.41)

by Mar to link the northern pits to the Coal Road at Alloa. The coal entered the town at the Coal Gate on the west side of the Kirkgate (Figure 1, centre left) where the church, manse and glebe stood. It was then taken through the narrow Coalgate and along the Coal Road to the harbour. Mar levelled out the gradient with cuttings through the hillier parts of the route for a wagon way, as it was called. This diverted the coal traffic away from the manse and glebe on Broad Street and the Limetree Walk which it runs parallel to. The coal once delivered to the harbour was stored in coal folds behind two L-shaped harbour buildings at the foreshore (Figure 5). Mar illustrated these buildings in a view from the dining-room window of Alloa House.<sup>34</sup> They were two stories high with white harled walls and red pantile roofs of traditional construction. In front of these stood a pair of handsome obelisk gate piers that marked the entry to the harbour for shipping, and they also marked the end of the 'Grand Allée' through the gardens and framed the view of the House of Alloa from the shore. The wagon way was laid with wooden rails to facilitate movement – these were replaced with iron rails by Lord Erskine later in the century.<sup>35</sup> Traces of some of these avenues still survive, and the Limetree Walk and Broad Street are still important thoroughfares in present-day Alloa.

The Firth of Forth at Alloa is full of deep silt, and in order to get ships of good size into dock Mar constructed a system for flushing the harbour. This was probably based on Edward's description of harbour sluices he had seen working in France in 1702.<sup>36</sup> Edward

had predicted that sluicing the Pow of Alloa would allow for ships of up to 300 tons, although Mar was eventually able to get ships of 500 tons to anchor.<sup>37</sup> Mar did this by constructing a sluice across the narrowest point of the bow-shaped loch in the eastern angle of the gardens. This held back the fresh water of the Brathie Burn which could be stocked with fresh-water fish and fowl (Figure 1, right). Near the shore the loch was closed by another sluice which filled with tidal sea water. Both sluices (Figure 5) could be opened at low tide to flush silt out of the harbour, and by 1714 the head of water was also being used to power a rope works and saw mill for the harbour (Figure 5).<sup>38</sup> The industries at the shore were further developed as a sail-making factory is recorded as functioning there by 1722.<sup>39</sup>

In 1710, at the request of the sea captains of the town, Mar obtained the custom rights for the port of Alloa.<sup>40</sup> Thus he obtained control of the entire stretch of the Forth from Kincardine and Elphinstone on the opposite bank of the Forth upstream as far as Stirling.<sup>41</sup> By the end of the eighteenth century Alloa supported 115 ships and exported to ports along the east coast of Scotland and London. In addition to the coal trade it exported glass, pig iron, woollen goods, ale, whisky and leather.<sup>42</sup>

#### HOUSING

Creating new roads involved rehousing some Alloa tenants in new houses on Broad Street away from the dusty coal traffic.<sup>43</sup> Likewise William Hutton, the mine manager, was given a croft at the foreshore to build himself a house in exchange for him maintaining the causeways and streets of the town in good repair.<sup>44</sup> Mar also brought skilled workers to Alloa. One who was probably involved in the maintenance of the dams and mines was John Watt, a smith from London whom he provided with a house and workshop for as long as he remained at Alloa.<sup>45</sup> This may be the same person described in the 'old' *Statistical Account of Scotland* as 'a remarkable good smith' whose 'still-yards and beams were particularly well executed'.<sup>46</sup>

Between 1706 and 1710 Mar laid out, on a grid-like plan, a new district which he called the 'New Town' of Alloa. It is roughly square and bounded on the north by present-day Bedford Place and on the east by the Limetree Walk (Figure 1, left side). Mar originally intended it as a salubrious residential area with a recreation ground to the rear of handsome houses facing the Limetree Walk. The handsome neoclassical villa of Robert Bald (1776–1861), the manager of the mines at Alloa, still stands in Bedford Place. Bald was a pioneer of improved working and living conditions for miners, and was the first mine manager to forbid the employment of women underground. Wood's plan of 1820 shows the district developed as Mar had planned it. However, by the early eighteenth century the Alloa glass works and warehouses had appeared at the shore end and by the later nineteenth century the district was rapidly overrun by warehouses and it remains semi-industrial today.

## AMANÉGEMENT

Until recently we have tended to see Edward's tour, with its focus on productive sciences such as agriculture and engineering, as typical of the frugality of the impoverished Scots, whereas to Edward's subscribers it may have suggested a viable alternative to colonial trade. The great landed estates of France had been developed by *amanénagement*, a form of infrastructure planning developed in the seventeenth century. Its successes were the construction of huge hydraulic schemes such as the great wheel at Marly (Figure 8). This was initially conceived to supply water for Louis XIV's pleasure gardens and pavilion but in addition the water was diverted to power cottage industries in the Île-de-France. Thierry Mariage describes how French landscape schemes penetrated the wider countryside, and how their more obvious aesthetic aspects were predicated on:

certain transformations of the environment based on an exploitation of the existing site and a knowledge of the latest cartographic and geographic techniques . . . networks of axes engendered new spaces within which the garden acts as an epicenter.<sup>47</sup>

The garden became only a small portion of an expanded park that included the exploitation of land resources, innovations in industries, agronomy, hydraulics and cartography. On a more general level D'Alembert described this as the *esprit de système* of the seventeenth century: the imposition of order onto rural chaos for the exploitation of the potential of the earth's surface for the benefit of man. In effect *amanénagement* is contemporary planning – roads, agrarian and industrial systems, urbanisation, and social and political systems. Indeed technical innovations in surveying, cartography and optics – the skills of the land surveyor – lie at the heart of the modern world.<sup>48</sup>

Was Scotland on the eve of the Union similarly infected by *esprit de système*? The Parliament's commissioning of the King's Hydrographer in Scotland, John Adair, to map Scotland county by county while the King's Historiographer, Sir Robert Sibbald (1641–1722), was appointed to systematically record and publish the natural history (*Scotia Illustrata*), the history of the people (*Scotia Antiqua*) and the present condition of the land (*Scotia Moderna*) would suggest this might be the case. The information gathered by Adair, Sibbald, Robert Wodrow (who assisted Sibbald) and Alexander Edward would produce a chorographic 'atlas' of the nation collated from a huge range of sources. Initially Adair's maps were funded by the Scottish Parliament but they were so painstakingly accurate that the money ran out long before the series could be completed.<sup>49</sup> These surveys and Walter Macfarlane's 'Geographical Collections', meant that Scotland, even before Sir John Sinclair published his pioneering *Statistical Account of Scotland* in the late eighteenth century, was one of the best mapped and most thoroughly inventoried small countries in the world. It was a lack of accurate maps that eventually stalled industrialisation in France.<sup>50</sup>

In the light of developments in France and Scotland, Edward's tour takes on a more sophisticated purpose than merely a desire for trendy gardening. *Amanénagement* might offer



a solution to Scotland's political weakness in the face of England's economic strength. Following the Darien disaster it may be that many Scots' landowners saw *esprit de système* as a less risky option than colonial investment. Occurring as it did seven years before the Union and largely supported by Jacobites and Episcopalians, the implication is that Edward's tour had a political aim – indeed Edward did take cipher letters to the exiled king at St Germain. A Jacobite conspiracy and gardening seem weak interpretations of a vision aimed, perhaps, at the creation of a modern political economy and the survival of Scotland's national autonomy.

Edward springs forth as a fully professional landscapist where none before had existed previously: no other Scottish gardener had yet made the transition to designing – that initiative remained with the nobility. The Scots nobility, unlike the French, retained their tradition of attending the universities where geometry, mathematics, drawing and surveying were part of the curriculum. In France these functions were taken up by educated craftsmen such as Le Nôtre, the Degotz family or the family of Mollet. These families made the transition from being gardeners to landscapists partly because their clients were either insufficiently educated for the role or unwilling to do this for themselves.

#### CONCLUSION

In 1724 Daniel Defoe described the impact of Mar's schemes on Alloa's economy:

The town . . . is full of trade, for the whole country has some business or other with them . . . this is the place where the Glasgow merchants are, as I am told, erecting magazines or warehouses to which they propose to bring their tobacco and sugars by land, and then to ship them for Holland or Hamburg or the Baltick or England as they find opportunity or market . . . Clackmannan [is] . . . known for yielding the best of coal, and the greatest quantity of it of any country in Scotland; so that it is carried, not to Edinburgh only, but to England, to Holland, and to France; and they tell us of new pits or mines of coal now discovered, which will yield such quantities, and so easy to come at, as are never to be exhausted; though such great quantities should be sent to England, as the Yorkshire Buildings Company boast of, namely twenty thousand ton a year . . .<sup>51</sup>

In 1724 the Erskine family were able to purchase their Alloa estate for £36,000 sterling from the York Buildings Company. Mar remained in exile until his death but his son and daughter continued to develop his programme of industrialisation up until the late eighteenth century, and Alloa remains today a successful industrial town. In some respects a victim of its own success, much of the town has been rebuilt over the centuries to provide for new incoming development. Nevertheless, there is still a huge amount of information to be recovered from detailed mapping and land surveying. Alloa is a landscape of the utmost historical importance: it was the fulfilment of much that was hoped for but never realised in France during the *ancien régime*. As one of the finest formal gardens and

most sophisticated industrial landscapes ever created, it is of international significance. Inexplicably no integrated survey of it has ever been undertaken by any official body in Scotland.

## NOTES

1. 'The Legacy of the 6<sup>th</sup> Earl of Mar', p. 6. I am grateful to Lord Mar & Kellie for allowing me to quote from his typescript of the original manuscript in his possession.
2. C. A. Whatley with D. J. Patrick, *The Scots and the Union*, Edinburgh, 2006, pp. 43 and 141–57.
3. *Ibid.*, p. 295.
4. W. Ferguson, *Scotland 1689 to the Present*, Edinburgh, 1968, p. 49.
5. Scottish History Online, 'The Treaty (Act) of the Union of Parliament 1707', <http://www.scotshistoryonline.co.uk/union.html>, accessed 29 March 2012.
6. Lord Archibald Hamilton at Cliveden to his brother Lord John Hamilton 4<sup>th</sup> Earl of Selkirk (1665–1744) at Hamilton, 30 September 1707, NLS MS 1033 (Fraser Collection).
7. Hopetoun Research Group Studies, Paper No. 1, 'The Diaries & Travels of Lord John Hope 1722–27', Occasional Papers, Extra Mural Department, University of Edinburgh, after 1986, p. 8.
8. *Ibid.*, Addendum by Mrs Hoffman-Klerkx, App pp. 2–3.
9. Report [for the Forfeited Estates Commission] of the . . . Estate of the Late Earl of Marr by Rothwell Townrow, 1716, NAS E/646/3/17, n.p.
10. Whatley, *Scots*, op. cit., p. 188.
11. M. Chrimes in A. W. Skempton, *Biographical Dictionary of Civil Engineers in Great Britain and Ireland Vol. 1, 1500–1830*, London, 2002, p. 441. Chrimes dates Sorocold's first visit to Alloa as c. 1707 but the earliest record that I have found in the M & K Papers is 1708.
12. C. T. Smout, 'The Erskines of Mar and the development of Alloa, 1689–1825', *Scottish Studies*, Vol. VII, 1963, p. 57, and Murray Dickie, 'Alloa—the town borne on water', *Alloa and Hillfoots Advertiser*, August 1992, p. 2.
13. Chrimes, *Engineers*, op. cit., p. 441.
14. Hutton's correspondence with Lord Grange, NAS GD124/15/1057/1–9, January to June 1712.
15. Mar suggested that another attempt to construct Sorocold's pumps should be made after the estate was purchased, Lord Erskine (dictated by Mar) at Paris to Lord Grange [? at Edinburgh], 10–12 December 1724, NAS GD 124/15/1261.1.
16. Chrimes, in *Engineers*, op. cit., describes the dams as a weir ten feet high.
17. Account (1835) for expenses in rebuilding the damhead at Forestmill, advanced by the Alloa Colliery, NAS GD 124/17/594.

18. Letter from William Hutton at Alloa to Colonel John Erskine at Stirling, 1 February 1709 [OS], NAS GD 1/1171/1.
19. Report [for the Forfeited Estates Commission] of the . . . Estate of the Late Earl of Marr by Rothwell Townrow, 1716, NAS E/646/3/17. The scheme is also mentioned by Mar in 'The Legacy of the 6<sup>th</sup> Earl of Mar', p. 16.
20. Smout, 'Erskines', op. cit., p. 61.
21. Sir John Sinclair of Ulbster, *Statistical Account of Scotland*, 1793, Vol. VIII, p. 616.
22. Chrimes, *Engineers*, op. cit., p. 441.
23. Ibid.
24. Sinclair, *Statistical Account*, op. cit., p. 616.
25. Sketch of the watercourses adjoining the Distillery erected by Mr Andrew Haig, late eighteenth century, NAS RHP 13276.
26. Sinclair, *Statistical Account*, op. cit., p. 616.
27. Ordnance Survey map, CXXXIX, 1866.
28. Report Forfeited Estates Commission, NAS E/646/3/17, n.p.
29. This identification was made by Emma Stewart of the Forestry Commission, and I am most grateful to her for drawing my attention to the woodlands, and to her and Christopher Dingwall for walking me through them.
30. 'Legacy', op. cit., p. 14.
31. *Ex inf.* Fiona Jamieson.
32. 'Legacy', op. cit., p. 14.
33. There is a drawing of an Alloa coal cart by David Allan in the National Gallery of Scotland, illustrated at <http://www.scran.ac.uk/database/record.php?usi=000-000-151-527-C&scache=4usep5kdqp&searchdb=scran>.
34. NAS RHP 13258/11.
35. Railscot website edited by Ewan Walker, accessed 30 July 2012: [http://www.railscot.co.uk/Alloa\\_Railway/frame.htm](http://www.railscot.co.uk/Alloa_Railway/frame.htm).
36. Letter from Edward at Haver de Grace to Mar, c/o Harrie Maule, Edinburgh, 7 July, 1702, NAS GD 124/15/219.
37. Inscribed on Figure 1, upper left.
38. Deposition in 1717, for the year 1715–16, to the Forfeited Estates Commission, NAS E646/3/112.
39. Macfarlane's Geographical Collections, *Scottish History Society*, Vols LI–LIII, March 1908, p. 309; NAS E646/3/94, and 111, 112 (FEP) Deposition in 1717, for the year 1715–16, to the Forfeited Estates Commission.
40. Petition [to the earl of Mar] by the skippers of Alloa asking him to get a Custom House at Alloa, 13 September, 1710, NAS GD 124/18/12. Smout, 'Erskines', op. cit., p. 60.
41. Sinclair, *Statistical Account*, op. cit., p. 637; Dickie, 'Alloa', op. cit., p. 2.
42. J. M. Wilson (ed.), *Imperial Gazetteer of Scotland*, Vol. 1, London and Edinburgh, 1868, pp. 36–7.
43. Pencil sketch (early eighteenth century) showing the Vennel, Kirkyard and Coalgate leading down to John Street in Alloa, NAS RHP 13261.

44. Deposition in 1717, for the year 1715–16, to the Forfeited Estates Commission, NAS E646/3/112.
45. Deposition in 1717, for the year 1715–16, to the Forfeited Estates Commission for Alloa Estate by John Watt, Smith in Alloa, NAS E646/3/108.
46. Sinclair, *Statistical Account*, op. cit., p. 623.
47. T. Mariage, *The World of André Le Nôtre*, trans. Graham Larkin, Philadelphia, 1998, Introduction, p. ix.
48. Ibid., p. 8.
49. National Library of Scotland, Pont Maps Website, article by C. W. J. Withers, <http://www.nls.uk/pont/bio/sibbald.html>, accessed 28 October 2006. L. W. Sharp (ed.), 'Early letters of Robert Wodrow, 1698–1709', *Scottish History Society*, 3<sup>rd</sup> series, Vol. 24, Edinburgh 1937.
50. Mariage, *Le Nôtre*, op. cit., p. 14.
51. D. Defoe, 'A tour thro' the whole island of Great Britain', Letter XII, Part 2, online at <http://www.undiscoveredscotland.co.uk/usebooks/defoe-scotland/index.html>, accessed 29 March 2012.